

## ABSTRACT OF THE DISCLOSURE

Disclosed is are gene sequences encoding  $\gamma$ -tocopherol methyltransferases from photosynthetic organisms. The enzyme  $\gamma$ -tocopherol methyltransferase catalyzes the methylation of  $\gamma$ -tocopherol to yield  $\alpha$ -tocopherol, the most bioactive species of tocopherol.  $\gamma$ -tocopherol methyltransferase is believed to be involved in regulating the relative amounts of the various tocopherols present in photosynthetic organisms. By introducing a genetic construct having a  $\gamma$ -tocopherol methyltransferase coding sequence placed under the control of a plant promoter into a plant, transgenic plants can be made having altered  $\gamma$ -tocopherol methyltransferase expression, to effect dramatic changes in the tocopherol profile of the plant.

Transgenic plants can be made that have  $\alpha$ -tocopherol as the predominant tocopherol in their seeds and oils.